

THIRD ANNUAL REPORT

OF THE

BOARD OF TRUSTEES

OF

CLEMSON AGRICULTURAL COLLEGE

TO THE

General Assembly of South Carolina.

1892.

COLUMBIA, S. C.

CHARLES A. CALVO, JR., STATE PRINTER.

1892.

REPORT.

*To the Honorable the Senate and the House of Representatives of
South Carolina :*

In compliance with the Statute regulating the same, the Board of Trustees of Clemson Agricultural College herewith submit to your honorable bodies their Third Annual Report for the fiscal year ending October 31st, 1892.

R. W. SIMPSON,
President Board of Trustees.

At the time of making the last Annual Report, October 31st, 1891, the work on the buildings was being rushed forward with all the energy possible, looking to their completion in time for the opening of the College the first of February following. Nearly one thousand applicants for admission into the College had been enrolled and the demand for the the opening of the College at that time seemed to be universal.

There was in our hands at the time of making the last Report a balance of \$3,707.40 only—an amount by no means sufficient to keep the work going on until January first following, when the appropriation which we confidently believed the Legislature would make would become available, or until the stated income from the Privilege Tax would begin to be paid in. Under these circumstances we were compelled to either stop work or borrow money and keep it going on. To stop work would effectually prevent the opening of the College at the time specified, and as we earnestly desired to see the College opened we borrowed upon our individual notes the sum of \$27,944.91. But the Legislature having declined to make the appropriation asked for left the financial affairs of the College in a precarious condition, and required the immediate attention of the Board, which met early in January, 1892, to consider the condition of the College and to give such shape to the work as would accord with the unexpected conditions occasioned by this refusal to grant us an appropriation.

The balance on hand at last Report, together with the \$27,944.91 borrowed upon the individual notes of the Trustees, had been about expended at the time of this meeting in January. We found therefore that we were indebted for this sum borrowed on the

notes of the Trustees.....	\$27,944 91
And also indebted for bills for material outstanding....	12,000 00
	<hr/>
	\$39,944 91

The stated income to be depended upon we could determine in part only, by estimate, and was placed as follows :

From indication it was agreed that the amount of the Privilege Tax would fall far short of the amount received from that source the year previous, which was \$56,000, and was estimated for this year at.....	\$35,000 00	
But from this amount had to be deducted the costs of the Agricultural Department, the balance only being appropriated to Clemson College. These expenses were estimated at.....	7,000 00	
		<hr/>
		\$28,000 00
Interest on Land Scrip Bonds and Clemson Bequest.....	10,000 00	
Balance on note from sale of Experiment Station.....	5,219 11	
		<hr/>
		\$43,219 11

Amount to be derived from sale of Agricultural Hall in Columbia, when sold.

It was readily seen, therefore, that the entire amount we could hope to realize from these several sources would hardly be sufficient to meet the debts outstanding, and that it would be necessary to stop work on the buildings, except such as could be done by the convicts, and cut down all expenses consistent with the preservation of the property on hand. It was also determined to sell the larger portion of the mules and wagons and to return at least seventy-five convicts to the Penitentiary. We regretted to have to pursue this course, but there was no other alternative. From the amount derived from the stated income we paid off the notes of the Trustees for \$27,944.91, and the bills for material, \$12,000.00, which left a small balance, which, with the proceeds from the sale of mules, &c., furnished a small sum with which we have kept three or four carpenters at work, and to direct the convicts, and to feed the mules and convicts retained. This force of carpenters and convicts were directed to proceed at once to put the buildings in a state of preservation. The result of their work will be stated hereafter.

The Board intended to renew the work on the buildings if the amount derived from the Privilege Tax should prove to be greater than the amount they had estimated, or as soon as the Agricultural Hall in Columbia could be sold. But in both of these particulars they

were disappointed. Only \$36,221.48 was received from the Privilege Tax, a deficiency in round numbers of \$19,779.00. And from the sale of the Agricultural Hall in Columbia we received nothing, making a total deficiency of \$40,000.00 in the Legislature's estimate of our assets. The Legislature evidently included this amount of \$40,000.00 in their estimate of the amount appropriated for the purposes of the College, and our failure to secure it left us in the condition existing at the beginning of the year, and prevented us from doing any more than to keep the little force at work and to preserve the College property. Early in the year 1891 the Board, in addition to the debts above mentioned, had contracted for heating, laundry and kitchen plants, amounting to \$10,000.00, to be paid for when erected in the buildings and operated to the satisfaction of the Board. It was necessary to make these contracts early in the year, not only to secure their delivery in time, but to enable us to build the kitchen and house for laundry to suit the requirements of the plants; and the heating apparatus had to be put into the buildings in the course of their erection. The loss from the sale of the Agricultural Hall and amount received from the Privilege Tax prevented us from complying with our agreement as to these contracts. We could not complete the buildings for the plants to be erected and tested, and thus the matter rests to-day.

The heating apparatus has been put into the Dormitory and Chapel, and the Laundry outfit has been delivered on the grounds since last March. It was a great mortification to the Board not to be able to pay these debts, but it could not be otherwise unless all work was stopped, and this course would have left many of the buildings to go to ruin and decay from rain and freezes, and otherwise entail much loss upon the State.

We are pleased to be able to report that the small force of three or four carpenters and the convicts have during the year accomplished very satisfactory results. They have completed the kitchen, room for the boilers, placed the boilers, built smoke-stack and baking department, and the kitchen is now ready for use. They have completed the inside work of the Dormitory, except painting, and it is now ready to be occupied, and is capable of accommodating six hundred students, being perhaps the largest house in the State. They have completed the dining room, finished building the walls of the Chapel, put on the roof, put in the windows and floored it. They have completed the walls of the President's house and put the roof thereon. They have nearly completed the Infirmary and have built a brick house for Laundry, 40 by 50 feet. They have built another brick Professor's house

and covered it in. They have built the tower to main building above the roof, and would have completed it but for want of necessary material we were not able to purchase, and are now flooring, ceiling and plastering the Main College Building, which work we hope to finish in about a month from this date unless the material therefor be exhausted. They have also made 900,000 brick, sufficient probably to complete the buildings as planned by the Board.

The buildings on the grounds now are as follows: Dormitory, Kitchen, Chapel, Main College Building, Experiment Station House, Laboratory, Mechanical Hall, Laundry, Infirmary, three brick Professors' houses completed, two brick Professors' houses covered in, seven framed 6-room cottages, canning factory, stables, cow houses and silos, and a number of servants' houses.

Notwithstanding the hampered condition in which we found the affairs of the College in January, 1892, we have not only accomplished the work as set out above, but have preserved the property of the College and paid off all debts and liabilities, except the contract debts for heating, kitchen and laundry plants, which amount to.....\$10,000 00

We since had to incur an additional liability of..... 1,200 00

for sash and doors to protect main building.

Salaries unpaid to date are..... 2,343 32

All available funds are now exhausted, and it will require

to feed the convicts and mules and keep our little force

employed to January 1st next a further sum of about.. 5,000 00

Leaving a total indebtedness of.....\$18,543 32

which amount of \$18,543.32 will have to be first paid out of any appropriation made for the next fiscal year.

The stated income for the next fiscal year may be estimated as follows:

Interest on Land Scrip Bonds and Clemson Bequest.....\$10,000 00

Privilege Tax, estimated at.....\$35,000 00

Less cost of Fertilizer Department, we being

only entitled to balance after paying these

expenses..... 7,000 00 28,000 00

Leaving available for College purposes.....\$38,000 00

From this amount deduct debts as above 18,543 00

Leaving balance for building purposes of.....\$19,457 00

The entire amount received from all sources since the commencement of the College in 1890 is..... \$186,682 20

The College is only entitled to the balance of the privilege tax after paying the expenses of the Department.

These expenses for the three years amount to..... 17,306 30

Making the total amount received by the College..... \$169,375 90

Of this amount there has been expended in tools and machinery, mules, wagons, clearing, ditching, roads, furniture, insurance, material on hand, &c., &c..... 32,571 39

Which amount of..... \$136,804 51
represents the cost of all the buildings.

The value of the buildings at contract prices is..... 165,000 00

Which amount of..... \$ 28,195 49
represents convict labor and the profits of the methods pursued by the Board in carrying on the work.

The amounts needed for this present fiscal year are as follows :

Necessary for buildings..... \$ 40,000 00

To pay contract debts for heating Laundry and Kitchen
plants..... 10,000 00

For water supply..... 5,000 00

Equipping Dormitory and Dining Room..... 5,000 00

“ Mechanical Hall (in part)..... 7,000 00

“ Scientific Departments (in part)..... 3,000 00

“ Agricultural Department (in part)..... 6,000 00

“ Main Building and Infirmary..... 1,957 00

Sewerage..... 1,500 00

Making a total of required..... \$79,457 00

The probable amount that will be received during the present fiscal year from Privilege Tax, interest on Land Scrip bonds and Clemson Bequest, less the liabilities outstanding as above stated, will be..... 29,457 00

Leaving a balance to be supplied..... \$50,000 00
by an additional appropriation, which amount we respectfully petition your honorable bodies to appropriate.

The question again recurs as to whether the College shall be opened next Spring or not. This Board still earnestly desires to see this noble and munificent enterprise completed, and its doors opened to the many

boys of the State who have applied for admission. To this end we have strained every point to have the buildings so far completed that, should the Legislature make the necessary appropriations asked for, the opening need not be deferred on account of an inability to be ready for that event.

For an itemized statement of the receipts and expenditures for the fiscal year ending October 31st, 1892, see the report of P. H. E. Sloan, Secretary and Treasurer, hereto appended.

Clemson College's share of the Morrill fund which has accumulated for the past four years, amounting to \$33,000, is now on hand. The Act of Congress appropriating this money to the States forbids that any of it be used for building purposes, and requires that it be expended only for teaching. If, therefore, the Legislature will make the appropriation asked for above, the Board will undertake to run the College for the first year on this Morrill fund.

EXPERIMENT STATION.

At the meeting of the Board in January last, it was determined to develop the Experiment Station to the full extent of the fifteen thousand dollars appropriation made by Congress for that purpose. Prof. J. S. Newman was put in charge thereof, who with Prof. J. F. C. DuPré, Assistant Horticulturist, have made very satisfactory progress in developing this very important branch of the College. Their reports, hereto attached, give in detail what they have accomplished. It is too early, however, to arrive at the yield of the farm and the profits therefrom. Most of the time was consumed in draining the low lands and clearing the forest lands and getting the farm ready for proper cultivation, and it was not expected that much would be realized from the crops this, the first year. But in this we have been agreeably disappointed. Sufficient of corn, sorghum, hay, peas, vegetables, &c., have been made to feed the convicts, mules and other stock for the next year. A canning factory was erected the latter part of the Summer, and a considerable quantity of vegetables were canned.

The results obtained by Profs. Newman and DuPré in their several departments have, and are still, attracting the earnest attention of the many visitors to the College grounds. The new thoughts suggested and methods pursued in connection with the results obtained by these gentlemen have impressed every one with the pleasing conviction that the agricultural interests of South Carolina may be redeemed from its present state of unprofitableness and made pleasant and remunerative.

FERTILIZER DEPARTMENT.

The reports of Prof. M. B. Hardin, Chemist, and Mr. J. P. Smith, Secretary, hereto attached, set out fully the work that has been done by this department during the fiscal year.

The necessity for the State to interfere and protect the farmers in the purchase of fertilizers is as imperative now as it ever was, and it is the purpose of this Board, when the press of their other duties in connection with the College will permit, to give particular attention to the needs of this department and to recommend such changes, both in the laws and the manner of selecting samples of fertilizers for analysis, as will afford the most complete protection possible for those who purchase and use these fertilizers. By reference to the report of the Secretary it will be observed that the cost of this department has been still further reduced.

REPORT OF THE HORTICULTURIST.

SOUTH CAROLINA EXPERIMENT STATION,
FORT HILL, S. C., October 31st, 1892.

To PROF. J. S. NEWMAN, *Vice-Director*.

DEAR SIR: The following report is respectfully submitted after a few hours' notice, and is of necessity both crude and incomplete.

Work in the Horticultural department was begun on 28th January, 1892, under your general and personal supervision.

Most of the lands allotted to us were in original forest, the remainder was in old fields ornamented with gullies, galded clay spots, Bermuda grass and quartz rock. All of it was poor hillside and ridge land. The gullies were the outcome of so-called hillside ditches.

All these lands have been properly terraced, thoroughly cultivated, and are now in much better condition, mechanically and otherwise, than when taken in hand. They have been planted in fruit and nut-bearing trees, grape vines, berry plants and vegetables. The trees and grape vines have been planted upon the terraces, alternating each other, except in the case of Delaware and Scuppernong grapes, which are planted in plats to themselves.

The aggregate fruit and nut-bearing trees planted is 1,442, as follows:

265 apples, in variety.

241 pears, “

311 peaches, “

170 plums (100 Oriental and 70 Wild Goose).

24 figs, in variety.

24 cherries, “

51 currants, “

31 gooseberries, “

12 quinces, “

100 pecans, “

20 walnuts, “

12 filberts, “

6 chestnuts.

50 miscellaneous, and

105 mulberries (the larger portion of which are planted in hog pasture).

1,422

Of the above, only about half dozen fruit trees and about 20 pecans have died.

GRAPES.

1,085 grape vines and cuttings in many varieties were planted. With very few exceptions these all lived and have put on a good growth. As in the case of the trees above mentioned, where there were six or more of one kind they were divided and planted on different exposures. Both the trees and the vines have been trimmed and cultivated, and I am now making trellises for the grapes.

POTATOES.

On 2d and 3d days of March we planted on the Pendleton road $\frac{96}{100}$ acres in Irish potatoes as a general crop. But included in this area were several experiments, to wit: Planting *whole* potatoes, both by the hill and by the pound. Potatoes cut to one and two eyes, also stem end, bud end, middles, &c. Also experiments as to distances and modes of cultivation. Of these experiments the yield from the *bud* end of potatoes was the largest (407 bushels per acre), and in distances those planted 36x20. The total yield of this plat was 296 bushels, equal to 308 $\frac{1}{2}$ bushels per acre.

On 2d and 3d days of April we planted 165 hills each of 47 different varieties, 36x20, in same field as above. The average yield of this variety test was 210 bushels per acre, ranging from 94, the lowest, to 328, the highest. It is proper to state that the late planting and a short drouth just after the planting greatly reduced the yield. A full description as to growth, time of maturity, size, shape, number of eyes, keeping qualities, &c., has been made of each and every variety, together with yield per acre, and will appear in Bulletin at proper time.

SECOND CROP.

We were prevented from making second crop by lack of labor at proper time to prepare and plant. This, as a rule, has been my best crop, and the potatoes are better keepers and better seed.

STRAWBERRIES.

Seven thousand plants of ——— varieties were set out in March on old, poor and cloddy land, but the plants lived, grew well, and made quite a crop of very fine berries. I am now extending this plant by setting out the runners from the old vines, and when done will have fully one acre. Observations as to growth of plant, date of flowering, size, shape and flavor of berry have been made and properly noted down. With water supply a very fine late or second crop could have been made, which, if the school was open, would have been very desirable.

CANTELOUPES.

Forty-three varieties of canteloupes were planted, aggregating 1,500 hills. The average yield was good, especially the earlier crop. The late fruit was mostly injured by worms, of which there was a full crop.

Observations as to 38 of these varieties were made, noting date of ripening, size, shape, color, thickness of rind, thickness of flesh, color and texture of flesh, netting, corrugation, quality, &c, all of which is recorded for future reference.

BEETS.

Of the fifteen varieties planted all did well, and proper note made of merits and demerits.

WATERMELONS.

Thirty-four varieties planted, all upon high ridge new ground. Some varieties in duplicate to test seed grown North and South and seed from different seedsmen. Duplicates were also found under *different names*, &c. Aggregate number of hills, 1,265.

Experiments were made as to different modes of culture, different kinds of fertilizers, seeds taken from different portions of the melon, &c., the results of which have been carefully noted.

Tests and observations of varieties as to date of ripening, size, shape, color of rind, color of flesh and seed, thickness of rind, texture, flavor, &c., were made and notes recorded.

The yield was entirely satisfactory, and surplus found ready sale.

CUCUMBERS.

Thirteen varieties. Usual notes as to size, shape, &c. Fed to convicts, hogs, &c., and several barrels packed in salt and brine for Winter use.

TOMATOES.

Thirty-three varieties transplanted. Several others, seed did not germinate. Tested plants on both old and new ground. Result in favor of old land.

Observations as to growth of plant, disease, maturity of fruit, yield, color, shape, weight, both gross and net, size of core and of cavity near seed, flavor, &c., carefully made and noted.

Earliest crop destroyed by worms; succeeding good. Fully half or more decayed before the canning house was completed. Put up 850

three-pound cans. If plant had been ready, could have canned 2,500 at very small expense. In July and early in August planted second crop from limbs or cuttings taken from old plants. An almost continuous drouth from time of planting delayed the growth and the ripening, but they made a fine crop of choice fruit. The vines have been taken up and placed in basement of chapel, where a large portion of the fruit will ripen. As in the case of other vegetables, a supply of water for irrigation would have secured a paying crop.

CABBAGE.

Thirteen thousand nine hundred and forty-one plants of thirty-seven varieties were transplanted, and all did well except about 4,000 set out in the river bottom, which were killed by the overflow. These were fed to the convicts, cattle, hogs, &c., and several barrels put away in salt and brine for Winter use, and which are keeping well. The usual memoranda as to date of heading, size, shape, &c., keeping qualities, number of heads per 100 plants, &c., was made and is on record. By a series of accidents and other circumstances that we could not control, the entire lot of plants intended for a Fall and Winter crop were destroyed.

About 1,000 plants of a still later planting were set out, but too late to expect a good crop.

Parsnips,	2 varieties.
Carrots,	5 varieties.
Okra,	2 varieties.
Pepper,	2 varieties.
Squashes,	2 varieties.

ONIONS.

About $\frac{1}{3}$ acre of Silver Skin, from *sets*, were planted as general crop. Yield 44 bushels, and entirely satisfactory. Onions rotted badly. One-sixth acre, planted in Yellow Danvers Globe from *seed*, produced $25\frac{2}{5}$ bushels large smooth onions, which are still firm and sound. Yield equal to 157 bushels per acre. Ten and a half bushels from seed on another plat.

Twenty-three varieties in small plats, from seed, produced sets, which sets are now growing side by side as a continued test.

BEANS.

Thirty-four varieties of Bunch or Dwarf Beans and eight varieties of Lima and other Pole Beans. Yield of Lima and Pole Beans satis-

factory. Three crops of Bunch Beans were made, the frost catching a portion of the latest crop.

Observations as to growth of plant, time of fruiting, diseases, color, shape, size, tenderness, strings, &c., of pods, were made and noted down. Product fed to convicts, and seven barrels packed down in salt.

One thousand asparagus roots.

TURNIPS.

Planted four varieties in March. Two of these, the Red Top Munich and White Norfolk Globe, got up to a stand. Both did exceedingly well, the Norfolk Globe succeeding the Munich, and lasting until other vegetables came in.

Something over one-half acre in Ruta Bagas, planted in July, and two to three acres in improved Seven Top at intervals in August and September, are doing as well or better than we expected, considering the almost continuous drouth since planting.

Other vegetables have been planted and other experiments made, but time will not permit mention of them now. Taking all the conditions and circumstances into consideration—the quality and condition of the land, the late date at which work began, the lack of labor and of implements, and other needed facilities—the result has been gratifying to me, and I hope satisfactory to you and to the Board of Control.

From the date when the turnips came in the Spring until this writing, the convicts have had a continuous ample supply of all the vegetables that they needed, and the surplus sold, packed away or fed to the stock.

Our needs in this department are now a more comfortable house for office and experimental purposes; second, improved tools for cultivation, implements and articles for destroying insects, gathering fruits, &c.; third, facilities for raising and propagating plants for future use—that is to say, a series of hot-beds, cold-frames, &c., or, what would be better, and perhaps not more expensive, a propagating house, say 18x75 feet, properly heated, &c.; and lastly, but by no means the least, a system of water works that will enable us to supply any deficiency from rain and to grow crops that need irrigation.

With sincere thanks for much-needed assistance and advice freely rendered by you, I have the honor to be,

Yours very truly,

J. F. C. DUPRÉ,
Assistant in Horticulture.

REPORT OF THE EXPERIMENT STATION.

S. C. EXPERIMENT STATION,
FORT HILL, S. C., October 31st, 1892.

Prof. H. A. STRODE,

Director S. C. Experiment Station.

DEAR SIR: I have the honor to report the following work done on the farm and experiment grounds of the Clemson Agricultural College between the 26th of January last, when I took charge, and the present date. I have endeavored, as far as the facilities at my command would permit, to carry out the plan of work adopted by the Board of Trustees at their meeting in Pendleton, January 19th, 1892.

For the farm and horticultural grounds 165 acres of new ground were prepared for cultivation.

In the river bottom 2.44 miles of under-drains were laid with brick, one-fourth mile of ditch straightened and half mile of open creek cleaned out.

Five and ninety-five hundredths (5.95) miles of new driveways have been opened, and much work done in repairing old roads, changing old fences and building new ones.

The following areas were planted in the crops named:

130 acres of new ground in corn.

52 acres of bottom land in corn.

10 acres of sorghum.

25 acres in German millet.

6 acres of corn, sorghum and other forage plants for experiments.

3.6 acres of tobacco.

7 acres of sweet potatoes.

50 acres of peas after small grain.

45 acres of peas broadcasted for hay and soil improvement.

52 acres of peas broadcasted in corn on the bottoms.

130 acres of peas drilled in new ground corn.

8 acres in cotton.

18 acres of grasses and clovers.

5 acres of peas for green soiling.

5 acres of rye and wheat for green soiling.

18 acres prepared for wheat to be sown this week.

The following areas, planted in small grain in 1891, were harvested and yielded as stated below :

80 acres planted, yielded of :

Oats, 878 bushels.

Rye, 9½ bushels.

Wheat, 6 bushels.

The following crops have been harvested to date, viz.:

<i>Hay</i> —Bermuda and other grass.....	30.93 tons.
Corn fodder.....	32.04 “
Pea vines.....	35.64 “
Sorghum fodder.....	1.87 “
Total.....	100.48 “

(A silo full of silage put up in 1891 being on hand, none was stored this year.)

Sorghum syrup.....	1,052 gallons, gross, mill measure.
Corn gathered.....	1,678 bushels.
“ to be gathered.....	120 acres.
Peas gathered.....	124 bushels.
“ to be gathered.....	175 acres.
Cotton gathered.....	5,000 lbs. in the seed.
“ to be gathered...	1,500 “ “ “

FIELD EXPERIMENTS.

With Corn—Soil tests of fertilizers.

Comparison of varieties.

Effects of detasseling.

Effects of pulling fodder.

Comparison of prepotency of male and female organs.

Comparison of methods of preparing new ground.

With Cotton—Soil tests of fertilizers, embracing—

(a) On sandy new ground.

(b) On old red loam.

(c) Special nitrogen tests on old red soil.

Cross-bud varieties, 70 in number.

Comparison of varieties, 21 in number.

Forage Plants—Comparison of species and varieties for green soiling as to yield and nutritive value, 18 varieties.

Comparison for silage, 4 varieties.

Sorghum—Comparison of yield of eleven varieties in syrup per acre and per 1,000 lbs. of cane.

Tested also for sugar in the chemical laboratory.

Tobacco—Soil test of fertilizers.

Comparison of 40 varieties.

Comparison of methods of curing.

Grass—Comparison of methods of preparing for.

NEEDS OF FARM AND STATION.

The most pressing present need is a fertilizer house, to be used for storing fertilizing material, manipulating composts and mixing chemicals for experiment purposes.

As early as practicable pasturage for swine should be fenced in and stock hogs of four breeds, in trios, provided. In addition to these there should be eight low grade sows, to be bred in pairs to the thoroughbred males, for the purpose of comparing the half-breeds as pork producers.

As rapidly as the means at command will allow compact bodies of land, not interrupted by drives, should be fenced with two wires, in order that cattle may glean the fields.

Two more breeds of cattle should be provided in trios in order that the profits of these thoroughbreds may be compared; but of greater importance as a matter of public interest is the comparison of the grades bred from these thoroughbred sires. A dairy of sufficient capacity to handle the milk of fifty cows should be provided as early as practicable and thoroughly equipped with the most approved appliances of both dairies and creameries; and to this should be attached a room for manufacturing cheese and one for curing the same. Connected with the dairy should be a class-room for special instruction in that department, but this is more elaborately discussed under the head of Suggestions as to Necessary Preparations for Opening the College (in another report).

I suggest that the mules on the farm be gradually disposed of as they can be sold to advantage, and their places supplied by mares.

The number of mares kept should be twice that actually required to perform the labor of the Farm and Horticultural Department. Half of the mares should be bred in March and April and half in August and September, in order that at least half shall be in condition for work at all times. Two stallions should be kept—one thoroughbred for saddle and light draft, and one for heavier draft and trotting.

One jack should also be kept, and all of these offered to the public at reasonable rates, to encourage improvement in the stock of the surrounding country.

Enough convict labor should be supplied to cultivate those parts of the farm too remote from the College to be cultivated by students, to complete during the approaching Winter the system of driveways, to continue the improvements of the creek and river bottoms, and to prepare lands too steep for cultivation for use as pastures.

I desire to express my appreciation of the interest you have ever manifested in the success of my work and your willingness to contribute as far as in your power to its success.

I am under obligations also to the President of the Board of Trustees and the Secretary of the Board for courtesies and support in the arduous labor of the year.

While all of those assigned to assist me have faithfully discharged their duty, I wish especially to express my recognition of the invaluable services rendered by Mr. J. F. C. DuPré, whose report of work done in horticulture accompanies this. He has applied himself with untiring energy and fidelity, and has conquered a magnificent success under most trying circumstances. I desire also to express my high appreciation of the services, sound judgment and sterling integrity of Mr. J. S. Pickett, Foreman of the farm.

Respectfully submitted,

J. S. NEWMAN,
Vice-Director.

REPORT OF THE CHEMIST.

FORT HILL, S. C., November 1, 1892.

HON. J. E. TINDAL,

Chairman of the Board of Fertilizer Control.

SIR: I respectfully submit the following report of the work done in this department for the Board of Fertilizer Control, for the fiscal year just ended. The number of analyses made is 298.

Classified as follows:

Official Fertilizer Samples.....	213
Farmers' Fertilizer Samples.....	23
Mineral and Potable Waters.....	26
Ores and Minerals.....	11
Clays.....	7
Marls.....	3
Miscellaneous articles.....	15
Total.....	298

OFFICIAL SAMPLES OF FERTILIZERS.

A detailed statement of the analyses of the official samples of fertilizers will be found in Bulletin No. 6 and supplement issued by the South Carolina Experiment Station, Clemson Agricultural College.

The several kinds of materials are as follows :

Nitrogenous superphosphates and fertilizers.....	123
Acid phosphates	30
Acid phosphates with potash.....	17
Kainit.....	18
Cotton seed meal.....	25
	—
	213

DEFICIENT SAMPLES.

Nitrogenous superphosphates deficient in phosphoric acid.....	20
Nitrogenous superphosphates deficient in ammonia.....	8
Nitrogenous superphosphates deficient in potash.....	5
Acid phosphates deficient in phosphoric acid.....	4
Acid phosphates with potash deficient in phosphoric acid.....	1
Acid phosphates with potash deficient in potash.....	4
Kainit deficient in potash.....	3
	—
	45

The tables show that 45 of the 213 samples, or 21.1 per cent., were deficient in one or more of the three fertilizing ingredients, phosphoric acid, ammonia and potash. Last year there were only 23 out of 306 samples, or 7.51 per cent. deficient. Thirty-three (33) of the 123 nitrogenous superphosphates and fertilizers, or 26.8 per cent., were found below guarantee in one or more constituents. Last year only 9 out of 176, or 5.11 per cent., were deficient.

Nine (9) of the 47 acid phosphates, with and without potash, or 19.1 per cent., are deficient. Last year only 6 out of 70, or 8.57 per cent., were below guarantee.

Three (3) of the 18 samples of kainit, or 16.7 per cent., are deficient : a slight improvement over last year, when 5 of 21 samples, or 23.8 per cent., were found below guarantee.

AVERAGES OF ANALYSES, 1891-92.

	<i>Per Cent. Found.</i>	<i>Per Cent. Guaranteed.</i>
Acid phosphates (30).		
Soluble phosphoric acid.....	9.53	
Reverted phosphoric acid.....	3.37	

Available phosphoric acid.....	12.90	11.80
Insoluble phosphoric acid....	1.73	

Total.....	14.63	
Acid phosphates with potash (17).		
Soluble phosphoric acid.....	8.06	
Reverted phosphoric acid.....	3.43	

Available phosphoric acid.....	11.49	9.93
Insoluble phosphoric acid.....	1.83	

Total.....	13.32	
Potash soluble in water.....	1.45	1.12
Nitrogenous superphosphates, &c., (123).		
Soluble phosphoric acid.....	6.01	
Reverted phosphoric acid.....	2.76	

Available phosphoric acid.....	8.77	8.01
Insoluble phosphoric acid.....	1.97	

Total phosphoric acid.....	10.74	
Ammonia.....	2.13	2.64
Potash soluble in water.....	2.08	1.45
Kainit (18).		
Potash soluble in water.....	12.51	11.79
Cotton seed meal (25).		
Available phosphoric acid (4).....	2.72	1.62
Ammonia (25).....	8.21	6.44
Potash soluble in water (4).....	1.50	1.00

FARMERS' SAMPLES.

It is respectfully suggested that hereafter no farmers' samples be analyzed unless they are collected and forwarded according to rules prescribed by the Board of Fertilizer Control. The analysis of samples injudiciously taken and improperly put up is of no value either to the Department or to the sender, and may easily lead to unnecessary controversy and litigation.

WATERS.

Twenty-six samples of water from various parts of the State have been analyzed during the year. A few of these samples were examined merely with the view of determining whether they were safe, potable waters. The majority of the samples were submitted to nearly complete analysis, all the principal constituents being determined. I regard these analyses of sufficient interest to be published, and hope that they may be put on record in a Bulletin of this station.

ORES, CLAYS, MARLS AND MISCELLANEOUS ARTICLES.

A number of the analyses made under these heads are also worthy of a place in the Station's Bulletins, as they not only bear upon the material interests of the State, but also show the extent and character of the work done by this department. In addition to the determinations mentioned in the classified list at the beginning of this communication, quite a number of rocks and minerals have been examined and reported upon. As analyses were unnecessary in these cases, it was thought inadvisable to swell the list of determinations made by assigning a separate laboratory number to each specimen.

ARRANGEMENT OF WORK.

The work on fertilizers has been done mainly by Messrs. C. W. Sims and F. S. Shiver, Dr. R. N. Brackett taking Mr. Shiver's place whenever the latter was engaged in the analysis of cattle foods, &c.

The work on ores, clays, waters, &c., has been performed chiefly by Dr. R. N. Brackett and Mr. C. W. Sims, Mr. Shiver participating when not otherwise occupied in Experiment Station analysis.

Very respectfully,

M. B. HARDIN,
Chief Chemist.

REPORT OF THE FERTILIZER BOARD.

FORT HILL, S. C., November 1st, 1892.

HON. J. E. TINDAL,

Chairman of the Board of Fertilizer Control.

SIR: I respectfully submit the following report of the work done in this department for the fiscal year ending October 31st, 1892.

The duties of this department, as at present constituted, are the regulation of the sales and the inspection and analysis of the commercial fertilizers sold in this State; also the collection of agricultural information and statistics.

FERTILIZER INSPECTION.

We have employed four fertilizer inspectors for the past season, and have endeavored to inspect and sample every brand of fertilizer sold in the State. We sample the goods only after they have left the hands of the manufacturers, except in cases of small factories, doing only a local business, when it is sometimes necessary to sample the goods at the mills. We have had but little trouble during the season in regard to the payment of the privilege tax, the manufacturers generally complying with the law cheerfully and showing no disposition to evade the tax—especially is this true in regard to the manufacturers in this State. Our books show that during the fiscal year just closed 144,385 tons of commercial fertilizers were sold in the State, against 212,393 tons last year: a decrease of 68,008 tons, or 32 per cent.

The privilege tax for the fiscal year amounted to \$36,096.48, against \$53,098.35, a decrease of \$17,001.87, or 32 per cent.

By reference to the Chief Chemist's report, it will be seen that 213 official fertilizer samples were analyzed during the season. Five thousand copies of the Bulletins containing these analyses were printed and distributed among the farmers of the State. This published report shows that 45 of the 213 samples, or 21 per cent., were found below the manufacturers' guarantee in some one of the fertilizing ingredients. While it is true that the number of brands found deficient is unusually large this season, our report shows that many of these brands were very slightly under the guarantees, the money values of the deficiencies ranging from 3 cents to \$2.60 per ton.

In addition to the official fertilizer work we have received a number of farmers' samples of fertilizers, drawn according to our directions, and have had them analyzed and reported the results to the persons sending them.

STATISTICAL INFORMATION.

I deem it unnecessary to mention the necessity for reliable statistical information as to the products of our State. In order to obtain such statistics we have secured a competent correspondent in almost every township in the State, and are collecting this information as rapidly as possible. While the report of the different crops for this year is not entirely complete, it is far enough advanced to show clearly that the cotton crop is from 30 to 40 per cent. short of the crop of 1891, and that the crops of corn, wheat, oats, rice, sorghum and tobacco are somewhat increased both in acreage and yield.

EXPENSES.

The report of the Secretary and Treasurer of the Board of Trustees of Clemson Agricultural College shows that the expenses of this work for the past year were \$6,082.07. An itemized statement of the same will be found with his report.

Very respectfully,

J. P. SMITH,

Secretary Board of Fertilizer Control.

FINANCIAL STATEMENTS.

REPORT OF EXPENDITURERS OF FERTILIZER DEPARTMENT CLEMSON AGRICULTURAL COLLEGE.

BY P. H. E. SLOAN, *Treasurer.*

Salaries Chemists and Clerk.	\$2,537 49	
Chemical Supplies.....	481 11	
Freight.....	70 52	
Printing Tags, &c.....	1,566 27	
Veterinary Service.....	142 88	
Inspectors' Salaries and Travel.....	1,001 50	
Augusta Exposition.....	118 35	
Incidentals.....	163 95	
		\$6,082 07

PENDLETON, S. C., November 11th, 1892.

The undersigned, Auditing Committee of the Trustees for Clemson Agricultural College, having duly examined the vouchers of the Treasurer for the year ending October 31st, 1892, Nos. 1 to 464, inclusive, and compared the same with the original bills, do hereby certify that all of said expenditures have been duly authorized and approved by the proper authorities, and are sustained by the vouchers.

J. E. BRADLEY,
J. E. WANNAMAKER,
JESSE H. HARDEN.

PENDLETON, S. C., October 31, 1892.

P. H. E. SLOAN, *Secretary and Treasurer,**In Account with CLEMSON AGRICULTURAL COLLEGE, Dr.*

1892.	To balance as per account rendered October 31, 1891.....	\$ 3,707 40	
	Cash from Experiment Station, expended on buildings.....	750 00	
	Cash borrowed on notes.....	27,944 91	
	Cash overpaid on building account..	1 06	
	Sale of farm products.....	403 10	
	Sale of condemned property.....	2,625 06	
	Privilege Tax.....	36,221 48	
	Clemson Bequest.....	3,621 26	
	Land Scrip.....	5,754 00	
	Sale Experiment Station notes.....	5,219 11	
			\$86,247 38
	By Paid on acc't fertilizer department..	\$ 6,082 07	
	Paid note made in 1891.....	6,444 91	
	Paid notes.....	27,944 91	
	Paid discounts and interest.....	712 99	
			41,184 88
	To balance to be expended for Clemson Agricultural College.....		\$45,062 50
	CONTRA.		
	By Am't pd. on acc't of travel of officers.	48 30	
	Am't pd. on acc't of convicts.....	3,144 52	
	Am't pd. on acc't of buildings.....	15,827 74	
	Am't pd. on acc't of lumber.....	4,545 60	
	Am't pd. on acc't of tools and machinery.....	182 10	
	Am't pd. on acc't of travel of Trustees.	684 49	
	A'mt pd. on acc't of teams and teamsters.....	1,869 11	
	A'mt pd. on acc't of salaries.....	2,589 98	
	Am't pd. on acc't of insurance.....	661 59	
	Am't pd. on acc't of office printing and stationery.....	209 71	
	Am't. pd. on acc't freight and express.	838 66	
	Am't pd. on acc't of labor.....	13,547 33	
	Am't pd. on acc't of furniture.....	701 42	
			44,850 55
	To balance.....		\$211 95

PENDLETON, S. C., June 30, 1892.

P. H. E. SLOAN, *Treasurer*,*In Account with* SOUTH CAROLINA EXPERIMENT STATION.

1891.			
July	10.	To United States Treasury Warrant.....	\$3,750 00
October	8.	To United States Treasury Warrant.....	3,750 00
1892.			
January	7.	To United States Treasury Warrant.....	3,750 00
April	6.	To United States Treasury Warrant.....	3,292 15
			<u>\$14,542 15</u>

CREDITS.

By salaries	\$4,812 47
By labor.....	3,087 80
By supplies.....	2,646 69
By freight and express.....	166 98
By postage and stationery.....	105 86
By printing	591 46
By library.....	130 27
By tools and implements.....	403 69
By scientific instruments.....	91 50
By chemical apparatus, &c.....	705 02
By general fittings.....	50 64
By buildings.....	750 00
By fences and drainage.....	9 60
By live stock	234 10
By traveling	57 87
By incidental expenses.....	29 78
By seed and plants.....	553 06
By repairs.....	115 36
	<u>\$14,542 15</u>

The undersigned, Auditing Committee of the Board of Trustees of Clemson Agricultural College for the Experimental Station, having duly examined the vouchers of the Treasurer for the year ending 30th June, 1892, Nos. 1 to 223 inclusive, and compared same with original bills, do hereby certify that all said expenditures have been duly authorized and approved by the proper authorities and are sustained by the vouchers.

JAS. L. ORR,
J. E. BRADLEY,
M. L. DONALDSON.